

CHAPTER FOUR

The People

A growing world population and the increase in wealth by many will increase the demand for horticultural produce to unprecedented levels. To meet this demand, modern horticultural production

is critically dependent on knowledge. It needs technically-competent, skilled people in all parts of the industry who can respond quickly to market opportunities and the vagaries of production.

The journey-to-you for vast volumes of horticultural products requires many skills



SUPPLY CHAIN STAKEHOLDERS



CROSS DISCIPLINARY STAKEHOLDERS

- Research & development and tertiary education
- Horticultural engineering & consultancy services
- Goods & services suppliers including financial services
- Beneficial participants, community activities, real estate, sports & recreation, regional authorities

Horticulture is a dynamic industry

People in horticulture have to adapt their local knowledge to changing factors in production, to advances in technologies such as disease management and to cope with changing climate and local and international economic conditions. Not only that, but they also need to adapt outside knowledge to their local conditions and have the flexibility to develop and adopt increasingly efficient production systems as market conditions change. Changing demands will require future professionals in horticulture to have the capacity to conduct both original and adaptive research in all aspects of what are often complex production and distribution systems.

These increasingly demanding skills have to be applied by all workers at all levels in horticulture, from growers with small units to those with large and sophisticated production operations, the technically complex packaging and sorting machine operations, and to those operating fast and efficient cool chains to end markets.

Specialised knowledge is required but application and implementation need multidisciplinary approaches.

Horticulture has long-term needs for investment in training institutes, schools, technical institutes, and universities that can deliver this specialised knowledge with formal technical training programmes, practical skill courses and professional tertiary degrees developed to the highest levels, including PhD.

In addition to these specialised horticultural knowledge fields, world horticulture needs many people in the ancillary support areas of trade expertise, computing, engineering, law, statistics and others. There is a real need for increased emphasis on horticulture as a career opportunity. Entrants to horticulture can expect rewarding careers and a deep satisfaction in the importance of their work in growing food, flowers and plants for the world.

Horticulture requires many skills at all levels to ensure success:

Successful horticulture production requires specialist knowledge in many disciplines

- seed production and nursery management
- crop management, including tree training and pruning
- plant physiology
- plant pathology and disease control
- entomology and pest control
- harvest management, including mechanical harvest options
- plant breeding
- soil and fertiliser management
- irrigation management
- weed control
- computing and software applications
- project management
- budgeting and financial management

Postharvest horticulture needs specialist skills

- postharvest management, including quality assurance and product quality assessment
- packaging technology
- sorting technology
- information technology, including product traceability
- engineering, including specialised knowledge applicable to harvesting, storage and transport
- market research
- processing technologies
- shipping knowledge
- specialised promotion and marketing intelligence
- storage technologies (cool and controlled atmosphere)
- supply chain logistics
- sales and marketing

Entrants to the knowledge world of horticulture can seek careers as:

- Teachers at all levels – school, tertiary, training
- Information/technical transfer specialists
- Marketing and sales personnel
- Specialist engineers
- IT specialists
- Economists
- Trade negotiators
- International marketing and promotion experts
- Financial management and investment professionals
- Expert growers
- Scientists
 - soil scientists
 - plant physiologists
 - environmental scientists
 - crop management specialists
 - postharvest specialists
 - pest and disease specialists
 - molecular biologists, sensory scientists, nanotechnologists and others
 - plant breeders



Improved cultivars, sophisticated production methods, and enhanced storage and packaging will need the input of highly-skilled professional growers, scientists, technicians and engineers who are proficient in horticulture and the related fields. Left: apple breeding, NZ INSTITUTE FOR PLANT & FOOD RESEARCH LTD. Right: packaged vegetables, supermarket, Beijing, China

Training

Horticulture is taught at most levels of education in many countries. This includes majors at high schools, special programmes within technical institutes and polytechnics, and degree programmes to PhD level at universities. Horticultural science is taught primarily at universities.

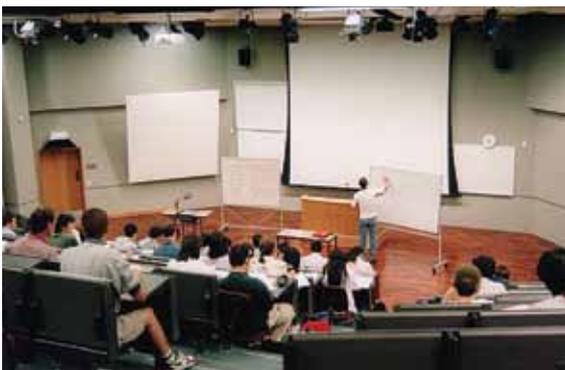
Within universities, special departments often deal separately with vegetables, fruit and viticulture, and may further separate into departments focussed on specialties such as production, postharvest, entomology, plant pathology, botany/plant physiology, soil science, engineering and economics. Clearly the amount of specialisation depends largely on the size of the tertiary institute and the numbers of students seeking enrolment. In general, degree programmes in both horticulture and horticultural science are increasing in enrolments in developing countries as the potential of horticulture to increase wealth, improve health and provide export opportunities is being realised.

In contrast, in developed countries, horticulture degree programmes are rapidly being amalgamated into general plant science departments as food supply, food security and low food prices are taken for granted after several decades of 'plenty'. Urbanisation of societies is also impacting as increasing numbers of young people have little knowledge or interest in rural employment in horticulture or in horticultural science.

The overall decline in horticulture enrolments in the developed world is increasingly creating tensions in relation to the failure of universities to graduate sufficient people to replace those who are retiring or to provide the basic support skills that are needed by industry. Significantly, government-supported farmer extension programmes, which are provided entirely by university trained personnel, are also being reduced in many countries including New Zealand, the United Kingdom and the USA as ongoing budget cuts take effect and urban-based priorities capture political agendas.

Further, the growing complexity of food production in the face of factors such as demands for sustainability, the impacts of climate change, 'buy local' campaigns, and the global spread of serious crop pests and diseases, means that greater rather than fewer numbers of highly skilled university graduates are needed than ever before. Rapidly escalating food prices, and even food shortages, are an inevitable consequence of short-sighted and short-term policies of governments and university administrations in developed countries who are allowing the demise of these degree programmes.

On average, horticulture provides twice the amount of employment per hectare of production as cereal crop production. Horticultural crop production is job rich and the options are very diverse.



Modern horticultural production requires the training of technical and professional people to the highest levels of tertiary education. PHOTOS: MASSEY UNIVERSITY

Thought Challenge #6

Universities in developed countries such as the USA, the United Kingdom, Germany, and The Netherlands have closed down many horticultural science departments over the past 30 years.

Q. In the future, where will the highly skilled, technically competent professionals come from to provide certainty to the supply of sustainably produced safe food, and to identify and manage cross-border incursions that can occur?

Viable communities need horticulture's employment opportunities



Developing countries

The horticultural industries within countries of the developing world need to achieve the level of sophisticated production that guarantees food safety and quality standards, and the economies of scale for viable export opportunities.

The initial benefits from increased horticultural investment and production are often replacing the gathering of food from the wild and moving to managed cropping.

The move from cereal production to high-value horticulture crops increases employment opportunities

in developing countries. The prosperity that flows from more effective use of land provides the surplus wealth required to maintain a sustainable population. Retaining the population preserves local services such as schools and hospitals that would otherwise be lost when land is depopulated. Horticultural production in developing countries is characterised by relatively low use of technologies and lower cost structures. Together with low cost labour, this actually makes developing countries internationally competitive.

Thought Challenge #7

The average age of farmers in Japan is now 66 years, reflecting the unwillingness of young people to become involved with farming. This ageing trend of farmers is also apparent in other countries, especially in advanced economies.

Q. Who will be the future food producers in Japan and other countries where young people are increasingly attracted to urban lifestyles and not to farming?

Women in horticulture

In today's horticultural industries, particularly in developing countries, women play significant roles as farmers, agricultural business leaders, labourers, entrepreneurs, and customers. These opportunities provide employment, enhance financial independence and raise living standards.

In fact, women comprise a majority (50% to 91%) of the horticultural labour supply in most developing countries. For example, in Mexico, 80% to 90% of people involved in sorting, grading and packaging of horticultural produce are women. However women face unique constraints in horticultural production systems including inadequate or unequal access

to land, credit, technology and information, and the difficulties associated with poor working conditions.

Horticulturalists are business people and entrepreneurs. There is a heavy reliance on women to ensure that all opportunities to enhance living standards through higher value horticultural crops are maximised.

Increasingly women are emerging as top educationalists and science leaders within research institutions focussed on the challenges that face horticulture across the world.

Lifelong learning for farmers – the COL solution

The impact of globalization has suddenly required millions of poorly trained farmers in developing countries to face new challenges and opportunities.

Agriculture in general and horticulture in particular has become more volatile, competitive, knowledge-led and market-oriented. The complexities of marketing perishable produce, minimizing storage and transport losses and complying with strict sanitary and phytosanitary standards are beyond the capacity of most smallholders.

One promising possibility for the up-skilling and knowledge transfer needed to address this challenge comes from the Commonwealth of Learning (COL), an inter-governmental organisation established by Commonwealth governments headquartered in Vancouver, Canada.

It has developed a learning process that is both an alternative and an adjunct to traditional transfers of knowledge. The Commonwealth of Learning approach takes up the practical and current knowledge of successful farmers and links it with sound research and the current knowledge already existing in a traditional and unsystematic form in the industry.

COL links farmers with various stakeholders in the industry allowing each party to benefit from each other's knowledge and to enhance their ability to negotiate with other stakeholders.

The emphasis in the Commonwealth of Learning model is on Open and Distance Learning (ODL) making extensive use of electronic, internet, digital and the latest ICT technologies.



The emergence of low-cost computers is transforming knowledge transfer in all countries.
PHOTO: WWW.COL.ORG

For instance, advantage has been taken of the boom and accessibility of mobile phones in the developing world.

Using voicemail, farmers, brokers, suppliers and women members of the learning chains can share quality learning conversations where members make their learning experience available to others.

The conversations are codified. Self-help groups form a strong active user constituency. The focus has been on strengthening the codified learning and tacit learning in the informal knowledge environment and linking it with formal knowledge resources to generate an upward spiral of learning networks.



Mobile phones are enhancing communication and providing an effective means of transferring knowledge about crops, production and marketing. PHOTO: WWW.COL.ORG

The community, instead of being a passive consumer of information, becomes a partner in knowledge management. Learning becomes self-directed.

In India indirect investment of US\$50,000 organized by COL has helped generate assets worth US\$1.3 million in 400 households in one year.

Changing times require advancements in education and research

We live in changing times with increasing urbanisation of populations, increases in living standards, growth in the power of multinational supermarkets, decreasing numbers of food producing farmers (but aggregation of land and operations), governments having fewer rural MPs to represent the farming sector (less political focus on farming), and a decline in agricultural services to farming communities over time (more user-pays cost-recovery). Additionally, postharvest food losses remain unac-

ceptably high despite international efforts to achieve Millennium Development Goals. The recent global economic crisis has caused major setbacks in achieving some MDG goals, and government and donor finances have been severely curtailed, especially in R&D and extension work.

Education and training in horticulture requires graduates who will become advisors and trainers to ensure that existing and proven farming information is fully utilised.

Training organisations

Many institutions and NGOs are involved in training farmers with seminars, workshops and other techniques. Among the higher profile organisations are:

- FAO [Food and Agriculture Organization of the United Nations]
- CIRDAP [Centre on Integrated Rural Development for Asia and Pacific, based in Sri Lanka]
- APO [Agricultural Productivity Organisation, based in Japan]
- World Vegetable Centre [AVRDC, based in Chinese Taipei and Tanzania]
- Australian Centre for International Agricultural Research [ACIAR]
- International Fund for Agricultural Development [IFAD, based in Rome]
- The Global Horticultural Initiative [GlobalHort]
- US Agency for International Development [USAID]
- European Union [EU] – multiple programmes from member countries and from EU per se [eg. CTA]
- International Tropical and Subtropical Fruit Network [TFNET, based in Malaysia]
- USAID Horticulture Collaborative Research Support Programme [HortCRSP, based at University of California, Davis]
- Commonwealth of Learning [COL, based in Vancouver] – specialises in distance education and training.
- CIRAD [Centre de coopération internationale en recherche agronomique pour le développement, based in France]

There are also many other institutions including universities and independents that run specialist programmes.